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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/851,701	05/08/2001	Hugues Hoppe	MS1-732US	3521

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EXAMINER	
SAJOUS, WESNER	

ART UNIT	PAPER NUMBER
2676	

DATE MAILED: 07/20/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/851,701	Applicant(s) HOPPE ET AL.	
	Examiner Wesner Sajous	Art Unit 2676	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 December 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9,11-13,15-43,45-61,63-65,67-71,73 and 74* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *12,13,15-43,45-52 and 74* is/are allowed.

6)☒ Claim(s) *1-4,6-9,11,53-61,63-65,67-69,71 and 73* is/are rejected.

7)☒ Claim(s) *5, 70* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Remark

1. This Office Action is in response to the amendment filed on April 28,2004. Claims 1-9, 11-13, 15-43, 45-61, 63-65, 67-71, and 73-74 are presented for examination. Claims 10, 14, 44, 62, 66, and 70 are canceled.

Allowable Subject Matter

2. The indicated allowability of claims 10, 62, 66, and 72 is withdrawn in view of the newly discovered reference(s) to Wells et al. (US 5123085). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-4, 6-9, 11, 53-61, 63-65, 67-69, 71, and 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoppe (a microsoft research paper) in view of Wells et al. (US 5123085).

Considering claim 1, Hoppe discloses a method comprising rendering a polygon mesh to produce a computer-generated image, image exhibiting aliasing at its discontinuity edges (interpreted as the creation of polygonal meshes with discontinuities

at its edge or with discontinuity in the visual appearance of the mesh. See section 2 in Hoppe). In addition, Hoppe discloses the functional equivalent for overdrawing the discontinuity edges as antialiased lines to reduce the aliasing (e.g., applying "geomorphs" to avoid visual discontinuities, and/or to further refined the polygonal mesh. See sections 3.2 and 3.3, paragraphs 1 and section 3.5).

Hoppe fails to teach edge sorting prior to overdrawing.

Wells discloses the functional equivalence for edge sorting prior to overdrawing. See col. 8, lines 62-67, wherein the overdrawing is characterized as the compositing or rendering of polygons edges.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the antialiasing method of Hoppe to include the edge sorting method in the same conventional manner as taught by Wells; in order to generate high quality polygons which are rendered in random order independent of the polygon depth (see Wells' col. 4, lines 55-57), and to minimize the error which occurs when attempting to render thin polygons (see Wells' col. 8, lines 51-52).

Re claim 2, Hoppe discloses polygon mesh comprises a set of triangles (see fig. 1).

As per claim 3, the claimed "image is stored in memory after rendering, and the overdrawing comprises rendering the discontinuity edges as antialiased lines in the memory... edges" is intrinsically performed in the disclosure of Hoppe. See abstract.

In claim 4, the claimed "identifying the discontinuity edges as a collection of silhouettes and sharp edges" is inherently disclosed in Hoppe disclosure at section 3.2.

As per claims 6, 7 and 9, the claimed "shading discontinuity edges and blending selected discontinuity edges; and asymmetrically blending selected discontinuity edges" is inherently performed by the system of Hoppe at sections 2, 3.2, and 3.3.

Re claim 8, the claimed "orienting the discontinuity edges in a consistent manner" is intrinsic to the disclosure provided at paragraphs 4-5 of section 3.2, and section 3.5.

Claim 11 is a computer-readable media comprising computer-executable instructions performing the method of claim 1, and is similarly rejected. See col. 1, lines 4-6.

Claims 53 and 56-57 contain features that are substantially analogous to the limitations recited in claim 1; they are, therefore, rejected under the same rationale as claim 1. Note that since the system of Hoppe is computer implemented and pertaining to graphics processing (see abstract), a processing unit, a graphics processor and a frame buffer memory are intrinsically included so as to perform the underlying functions.

Claim 54 is rejected for the same reason as claim 2.

Claim 55 is rejected for the same reasons as claim 4.

Claims 58-61 recite the features of claims 6-9, respectively, they are, therefore, rejected for the same reasons as claims 6-9.

Considering claims 63-64, it is noted because the features of claim 63 are analogous to the limitations of claim 1, the limitations of claims 63-64 are, therefore, rejected under the same rationale as claim 1. Note that because in Wells, polygons edges are sorted according to x and y coordinate values (see Wells' col. 8, lines 63-67), the polygon edges are therefore sorted according to depth. The purpose of sorting

edges according to depth is to generate high quality polygons that are rendered in random order independent of the polygon depth. See Wells' col. 4, lines 55-57. Note that since a graphics processing system is implemented in Hoppe, a data structure is contemplated.

Re claim 65, the claimed "identifying sharp edges ... prior to rendering the polygon mesh" is met Hoppe's disclosure at section 2, because in order to increase the accuracy of the LOD, sharp edges of the mesh must be identified prior to rendering the mesh. The Applicant is directed to col. 12, lines 53-63 of the DeRose et al. reference (USP 6037949), which makes reference to Hoppe as support for performing the above claimed features.

Claim 67 contains features that are analogous to the limitations of combined claims 6 and 9; it is rejected under the same rationale as claims 6 and 9.

Claim 68 is rejected for reason similar to claim 47.

Claim 69 is a computer-readable media with program instructions performing the method of claim 63, it is, therefore, rejected under the same rationale as claim 63.

Claim 71 is rejected for the same reason as claim 6.

Claim 73 is computer-readable medium that performs the combined methods recited in claims 7 and 8; it is, therefore, rejected under the same rationale as the combination of claims 7 and 8.

Allowable Subject Matter

5. Claim 70 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, because the prior art fail to suggest a discontinuity edge detector that is configured to identify sharp edges of the polygon mesh prior rendering the polygon mesh, and finding silhouette edges after rendering, wherein the discontinuity edges is a union of the sharp edges and the silhouette edges.

Claims 12-13, 15-43, 45-52, and 74 are allowed over the prior art because the prior art of record fails to particularly teach constructing a data structure prior to rendering a polygon mesh; finding (or identifying) silhouette (and/or sharp) edges in the polygon mesh during runtime using the data structure; and omitting concave silhouette edges in the polygon mesh during runtime from the data structure; and collecting the sharp edges and the silhouette edges in the list to form discontinuity edges of the polygon mesh (as recited in claims 21 and 28). The prior art of record fails to teach sorting the discontinuity edges according to visibility and overdrawing the discontinuity edges in an order resulting from the sorting (as recited in claim 34); steps A and B according to claim 48; and means for identifying silhouette edges that occur from at least one viewpoint of the rendered image; means for shading and sorting the discontinuity edges; and means for overdrawing the discontinuity edges as antialiased lines (as recited in claim 74).

Conclusion

Any response to this action should be mailed to:

Box
Commissioner of Patents and Trademarks
Washington, DC 20231

or faxed to:

(703) 872-9314, (for technology center 26000 only)

0r:

(703) 308-5359 for informal or draft communications, please label "PROPOSED"
or DRAFT")

Hand-held delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, 6th floor (receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesner Sajous whose telephone number is (703) 308-5857. The examiner can be reached on Mondays thru Thursdays and on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Supervisor, Matthew Bella, can be reached at (703) 308-6829. The fax phone number for this group is (703) 308-6606.

Wesner Sajous
7/5/2004

ULKA J. CHAUHAN
PRIMARY EXAMINER